

Assessment of awareness about COVID-19 disease and vaccine uptake

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Abstract

Objective: To evaluate the awareness of individuals about coronavirus disease-2019 disease and vaccines during the pandemic.

Method: The descriptive, cross-sectional survey-based study was conducted at family health centres in the Bursa province of Turkiye from July 1 to 7, 2021. The face-to-face survey of registered individuals had 20 items that measured coronavirus disease-2019 and vaccines. The scale was named the Coronavirus Disease-2019 and Vaccine Awareness level. It was carried out by family physicians using an online weblink. The Cronbach alpha coefficient was 0.87. Data was analysed using SPSS 25.

Results: Of the 228 subjects, 129(56.6%) were males and 99(43.4%) were females. The overall mean age was 27.82±10.28 years. Awareness levels were high with a mean value of 2.41±0.31. Female participants were more aware than males (p=0.04) and those with monthly income between 2000-10000 Turkish lira had lower awareness level compared to other income groups (p=0.03). Marital status (p=0.32), education level (p=0.49) comorbidities (p=0.23), regular drug usage (p=0.13) and exercise status (p=0.24) did not affect the awareness levels. Non-smokers were more aware than the smokers (p=0.01).

Conclusion: The level of awareness about coronavirus disease-2019 and its vaccine was higher in the female gender and non-smokers, it was lower in the middle-income group.

Keywords: COVID-19, SARS-CoV-2 infection, Vaccination, Awareness, Survey.

(JPMA 73: 88; 2023) DOI: 10.47391/JPMA.5084

Submission completion date: 12-11-2021 — **Acceptance date:** 16-05-2022

Introduction

Coronavirus disease-2019 (COVID-19) is a viral infection caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). The COVID-19 pandemic has affected and continues to affect the whole world with increasing frequency since the day it was first reported in China in December 2019.^{1,2} Currently, there is no curative treatment method for COVID-19 yet. Therefore, there is a need for a safe and effective preventive way, namely a vaccine, to control this pandemic, which has devastating medical and economic effects and causes human deaths. To date, different vaccines for emergency immunisation have been developed, approved and used. Vaccination has been a glimmer of hope to prevent the spread of COVID-19 infection.³

Awareness about the disease and vaccine is essential in the COVID-19 pandemic. Different conditions, such as different cultures and education levels, socioeconomic status (SES), and religious beliefs, create differences in the perspective of COVID-19. Despite these differences,

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information and awareness should always be made in line with scientific facts to protect public health.⁴⁻⁸

Understanding society's perspective on disease and vaccination provides vital information to improve awareness on any issue. The current study was planned to evaluate the level of awareness and understanding about COVID-19 disease and vaccines.

Subjects and Methods

The descriptive, cross-sectional survey-based study was conducted at family health centres in the Bursa province of Turkiye from July 1 to 7, 2021. After approval from the Ministry of Health, Turkiye, and the clinical research ethics review committee of Bursa Uludag University. For the 25 family healthcare centers, the sample size was calculated with 10% margin of error and 98% confidence level. The number of samples was calculated with "N: size of the universe, t: normal distribution value at a given α level, σ : universe variance, d: tolerance amount (error amount) values" and "n=(Nt² σ 2)/(d2 (N-1)+t2 σ 2) formula".⁹ The number of subjects admitted to the volunteer 25 family health care centers was 2521 during the study period of one week. It was calculated that at least 205 subjects should be included by simple random sampling method in the study with a 10% margin of error and 98% confidence level. The study was conducted on n=228 subjects with valid data. Those included were registered

individuals of either gender admitted to any of the family health centres for any reason by the family physicians across the province. Subjects with cognitive adaptation problems, hearing, visual impairments, and not willing to participate were excluded.

After taking informed consent from the subjects, the survey was conducted through face-to-face interview by 33 family physicians via a weblink that was established for the purpose. Data included sociodemographic characteristics, height, body weight, body mass index (BMI), waist circumference, current diseases, if any, drugs being used, smoking and exercise status, and awareness about COVID-19 disease and vaccines. The subjects were asked to evaluate 20 statements that measured their awareness of the COVID-19 disease and vaccines. In the questionnaire, statements 1-4 and 17-19 assessed the awareness levels of the participants about the COVID-19 disease, while statements 5-16 and 20 aimed at evaluating the level of awareness about the COVID-19 vaccine.

Cronbach Alpha analysis was applied to test the reliability of 20 statements about COVID-19 disease and vaccine awareness. Cronbach alpha coefficient was 0.87, indicating its reliability. There was no need to remove any questions from the study. After the reliability analysis, factor analysis was applied to the scale to test the construct validity. All the 20 expressions were gathered under a single (factor) dimension, which was called the level of awareness of the COVID-19 disease and vaccine. It was determined that the explained variance level was 58%, the Kaiser-Meyer-Olkin (KMO) sample adequacy level was 0.87, and the one-dimensional structure was significant, with Barlet's chie-square value 1235.27 ($p=0.01$). It was determined that the scale consisted of only one dimension and was reliable and valid.

Factor analysis is a method used to reduce the expressions defined in likert type to one or more dimensions. Expressions are divided into dimensions according to

their distribution. Certain assumptions must be made while making this distinction. Barlet's test, KMO coefficient and explained variance level are among these assumptions. Barlet's test tests whether the factor structure obtained is significant. The KMO coefficient indicates whether the sample level is sufficient ($KMO>0.70$). The level of variance explains shows how much the level of data loss is in the process of reducing the expressions to dimensions. The variance rate explained in a scale with one-dimensional structure should be $>40\%$, and it should be 65% or more in multi-dimensional structures.

In the evaluations, the scale was prepared in a triple likert structure. Scale scores ranged from 1 to 3. A score of 3 or close to 3 was considered a high level of awareness.

Data was analysed using SPSS 25. Frequencies and percentages were calculated to examine the demographic and other characteristics of the participants. The expressions and dimension scores in the scale were reported as median and range. Mann Whitney U test was used to examine the difference in the level of awareness of COVID-19 vaccine according to gender, marital status, drug use and chronic disease status. $P<0.05$ was considered statistically significant.

Results

Of the 2521 subjects enrolled with the health centres, 228(9%) were included. There were 129(56.6%) men and 88(43.4%) women. The overall mean age was

Table-1: Examination of the reliability level of the coronavirus disease-2019 (COVID-19) disease and vaccine awareness scale.

Statements	X±S.D.	μ (Min-Max).
1. The SARS-CoV-2 virus that causes COVID-19 is transmitted from person to person	2,89±0,33	3 (1-3)
2. COVID-19 can occur in all age groups	2,92±0,32	3 (1-3)
3. Social distancing, mask use and washing hands with soap and water are very important in protection from COVID-19	2,91±2,68	3 (1-3)
4. The risk of contracting COVID-19 increases in diseases such as diabetes, obesity, asthma, heart disease, and cancer	2,71±0,58	3 (1-3)
5. Vaccination is very important in preventing COVID-19	2,85±0,44	3 (1-3)
6. There are different vaccines in use to protect against COVID-19	2,86±0,39	3 (1-3)
7. All vaccines used to protect against COVID-19 are protective	2,42±0,74	3 (1-3)
8. 1 dose of vaccine is enough to protect against COVID-19*	2,36±0,63	1 (1-3)
9. I prefer to have traditionally produced vaccines to protect against COVID-19*	2,43±0,73	2 (1-3)
10. I prefer to have vaccines produced with new technology (mRNA vaccine) more in protection from COVID-19	2,44±0,65	3 (1-3)
11. I prefer not to be vaccinated to prevent COVID-19*	2,00±0,64	1 (1-3)
12. The reason I choose not to be vaccinated against COVID-19 is because I think vaccines have side effects*	2,06±0,72	1 (1-3)
13. People who have been vaccinated for protection from COVID-19 should also continue to follow the rules of social distancing, use of masks and washing hands with soap and water	2,93±1,97	3 (1-3)
14. I obtained my information about the COVID-19 vaccine through visual, printed media or the internet	2,73±0,63	3 (1-3)
15. I obtained my knowledge about the COVID-19 vaccine by researching the scientific medical literature	2,68±3,38	3 (1-3)
16. I have never researched the COVID-19 vaccine, I am informed by what I have heard from my environment*	2,01±0,74	1 (1-3)
17. I know about the prevalence of COVID-19 in our city	2,64±0,58	3 (1-3)
18. I have information about the prevalence of COVID-19 in our country	2,79±0,51	3 (1-3)
19. I know about the prevalence of COVID-19 in the world	2,70±0,56	3 (1-3)
20. COVID-19 vaccines can be applied to people of all ages	2,20±0,75	2 (1-3)

*negative expressions reverse coded.

Table-2: Features of the participants and association with awareness level of coronavirus disease-2019 (COVID-19) disease and vaccine.

Participant Features		The number of participants N	COVID-19 disease and vaccine knowledge and awareness level X±s.s.	p
Gender 0,04*	Male	129	2,30±0,26	0,32
	Female	99	2,54±0,36	
Marital status	Single	181	2,42±0,31	0,49
	Married	47	2,37±0,28	
Educational status	Elementary and below	9	2,40±0,23	0,49
	Secondary-High School	24	2,42±0,42	
	University	195	2,41±0,29	
Income status 0,03*	No	121	2,45±0,31	0,23
	Below 2000 TL	25	2,53±0,46	
	2000-5000 TL	45	2,32±0,21	
	5000-10000 TL	28	2,30±0,23	
	Over 10000 TL	9	2,50±0,26	
Co-morbidity	No	203	2,42±0,31	0,13
	Yes	25	2,32±0,26	
Regularly used medication	No	182	2,42±0,31	0,24
	Yes	46	2,38±0,30	
Smoking 0,01*	None	152	2,49±0,29	0,24
	I quit	30	2,31±0,39	
	I'm smoking	46	2,28±0,30	
Exercise status	None	67	2,37±0,32	0,24
	Less than 150 Minutes	107	2,43±0,27	
	More than 150 Minutes	54	2,43±0,35	

*Significant difference at 0.05 level.

27.82±10.28 years.

Awareness levels were high with a mean value of 2.41±0.31. Mean value for each statement was recorded independently (Table-1).

Female participants were more aware than males (p=0.04) and those with monthly income between 2000-10000 Turkish lira had lower awareness level compared to other income groups (p=0.03). Marital status (p=0.32), education level (p=0.49) comorbidities (p=0.23), regular drug usage (p=0.13) and exercise status (p=0.24) did not affect the awareness levels. Non-smokers were more aware than the smokers (p=0.01) (Table-2).

Discussion

Vaccination is one of the most effective ways to reduce the burden of COVID-19. The success of vaccination programmes is closely related to the awareness of people about the disease and the vaccine. A study involving university students concluded that the COVID-19 pandemic was caused by insufficient knowledge about the virus.¹⁰

Hesitations about COVID-19 vaccines vary according to the

sociocultural characteristics of societies and their situations during the pandemic.¹¹⁻¹⁵ The new and rapid development of vaccines, the different social and political approaches of countries, the differences of opinions among scientists,¹⁶ and the characteristics of the vaccine,¹⁷ explain the changes in awareness about the vaccines.

In Turkiye, science-based information is provided in many fields regarding COVID-19, and this information is presented to the public in visual and print media. The younger people in society also get information about the subject through social media. The mean age of the participants in the current study was 27.82±10.28 years, and 85.5% of them had a high education level. The female participants' level of awareness, who made up 43.6% of the study group, about the COVID-19 disease and vaccine was higher than the male gender. This situation may be related to the fact that the female gender follows both the print and visual media and social media more closely.

Considering the average score out of 3 of the 20 expressions in the survey, the level of knowledge about COVID-19 disease, its spread, and forms of protection was relatively high. The highest scores in the survey were for the statements: "The SARS-CoV-2 virus that causes COVID-19 is transmitted from person to person", "COVID-19 can be seen in all age groups", "Social distancing, use of masks and washing hands with soap and water in protection from COVID-19 washing is very important". The information and awareness scores were the lowest in the statements: "I do not prefer to be vaccinated for protection against COVID-19", "The reason why I do not prefer to be vaccinated against COVID-19 is because I think that vaccines have side effects" and "I have never researched the COVID-19 vaccine, I am knowledgeable with what I hear from my environment". This finding indicated that the area with the lowest awareness was the subject of vaccination.

The results differ in different studies on vaccine awareness and acceptance. Although age, race, marital

status, current residence, monthly income, occupation, and medical conditions, like diabetes mellitus and hypercholesterolaemia, of the participants in a study conducted in Malaysia were revealed as factors affecting vaccine acceptance, studies published in China and Saudi Arabia showed that only gender and marital status were significant factors.^{18,19}

Similarly, the current study observed that while female gender, low and high monthly income levels, and habits affected COVID-19 disease and vaccine awareness, age, marital status, education level, comorbidities and chronic drug use were ineffective. What made the current study different from other studies in the literature cited above was the fact that the participants were primarily young, single, highly educated, had an average BMI and had a low rate of chronic disease and drug usage. The differences may be due to different study methodologies and sociodemographic characteristics.

It is known that some chronic diseases, such as diabetes, obesity and chronic lung diseases, and some drugs may increase the risk of COVID-19.²⁰ In the current study, the level of consciousness in chronic patient groups and those with drug use was similar compared to those who did not. This finding can be explained by the participants' low rates of chronic disease and chronic drug usage and the inadequate evaluation of the results.

As a result, COVID-19 is the most severe public health problem globally today. Preventive medicine with vaccination is critical since no drug has been developed to treat the disease yet. Compulsory administration of COVID-19 vaccines is essential to staying healthy.²¹ This is why it is necessary to increase awareness about COVID-19 disease and vaccination.²²

In terms of limitations, the cross-sectional design and the involvement of highly educated and young participants in the sample may reduce the generalisability of the findings.

Conclusion

The level of awareness about COVID-19 vaccination during the pandemic was higher in the female gender and among the non-smokers, while it was lower in the middle-income level.

Disclaimer: None.

Conflict of Interest: None.

Source of Funding: None.

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